TRANSFER FACILITIES—VCS DESIGN AND INSTALLATION

§ 154.2100 Vapor control system, general.

(a) Vapor control system (VCS) design and installation must eliminate potential overpressure and vacuum hazards, overfill hazards, sources of ignition, and mechanical damage to the maximum practicable extent. Each remaining hazard source that is not eliminated must be specifically addressed in the protection system design and system operational requirements.

(b) Vapor collection system pipe and fitting components must be in accordance with ANSI B31.3 (incorporated by reference, see 33 CFR 154.106) with a maximum allowable working pressure (MAWP) of at least 150 pounds per square inch gauge (psig). Valves must be in accordance with ASME B16.34, 150 pound class (incorporated by reference, see 33 CFR 154.106). Flanges must be in accordance with ANSI B16.5 or ANSI B16.24, 150 pound class (both incorporated by reference, see 33 CFR 154.106). The following components and their associated equipment do not have a minimum specified MAWP, but must be constructed to acceptable engineering standards and have the appropriate mechanical strength to serve the intended purpose: knockout drums, liquid seals, blowers/compressors, flare stacks/incinerators, and other vapor processing units.

(c) All VCS electrical equipment must comply with NFPA 70 (2011) (incorporated by reference, see 33 CFR 154.106).

(d) Any pressure, flow, or concentration indication required by this part must provide a remote indicator on the facility where the cargo transfer system and VCS are controlled, unless the local indicator is clearly visible and readable from the operator's normal position at the control stations.

(e) Any condition requiring an alarm as specified in this part must activate an audible and visible alarm where the cargo transfer and VCSs are controlled.

(f) For a VCS installed after August 15, 2013, an alarm or shutdown must be activated if electrical continuity of an alarm or shutdown sensor required by this subpart is lost.

(g) The VCS piping surface temperature must not exceed 177 °C (350 °F) or 70 percent of the auto-ignition temperature in degrees Celsius of the vapors being transferred, whichever is lower, during normal operations. This must be achieved by either separating or insulating the entire VCS from external heat sources.

(h) The VCS must be equipped with a mechanism to eliminate any liquid condensate from the vapor collection system that carries over from the vessel or condenses as a result of an enrichment process.

(1) If a liquid knockout vessel is installed to eliminate any liquid condensate, it must have—

(i) A mechanism to indicate the level of liquid in the device;

(ii) A high liquid level sensor that activates an alarm, meeting the requirements of paragraph (e) of this section;

(iii) A high-high liquid level sensor that closes the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a), and shuts down any vapor-moving devices before carrying liquid over from the vessel to the vapor-moving device. One sensor with two stages may accomplish both this requirement and the requirement of paragraph (h)(1)(ii) of this section; and

(2) If a drip leg is used to eliminate any liquid condensate, it must be fitted with a mechanism to remove liquid from the low point.

(i) Vapor collection piping must be electrically grounded and must be electrically continuous.

(j) If the facility handles inerted vapors of cargoes containing sulfur, the facility must control heating from pyrophoric iron sulfide deposits in the vapor collection line.

(k) All VCS equipment and components, including piping, hoses, valves, flanges, fittings, and gaskets, must be suitable for use with the vapor in the VCS.

§ 154.2101 Requirements for facility vapor connections.

(a) A remotely operated cargo vapor shutoff valve must be installed in the vapor collection line between the facility vapor connection and the nearest point where any inerting, enriching, or diluting gas is introduced into the